PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Nez Perce Tribal Hatchery Monitoring And Evaluation

BPA project number: 8335003
Contract renewal date (mm/eye): 1/2000 ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Nez Perce Tribe Departement of Fisheries Resources Management

Business acronym (if appropriate) NPT

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses
7.4M, 7.3B, 7.3B.2, 7.4F, 7.5B.1, 3.2, 7.1B,7.1C, 7.1G, 7.1H

FWS/NMFS Biological Opinion Number(s) which this project addresses
O682 - Endangered Species Act Section 7 Consultation. Biological Opinion. Nez Perce Tribal Hatchery 1998 -2002 Hatchery Operations. 1164 - Section 10 Permit

Other planning document references
Salmon and Steelhead Production Plan. Clearwater River Subbasin; Nez Perce Tribal Hatchery Master Plan and Appendices; Wy Kan Ush Mi Wa Kish Wit (Tribal Recovery Plan); Supplement to Nez Perce Tribal Hatchery Master Plan; Proposed Snake River Recovery Plan

Short description
Continue implementation a comprehensive ecosystem approach to monitoring and evaluation (up to 83 performance variables) of NPTH to determine success of restoring salmon populations and avoiding adverse ecological impacts in the Clearwater River sub-basin.

Target species
Spring and Fall Chinook Salmon (Oncorhynchus tshawytcha), and Coho Salmon (O. kisutch)

Section 2. Sorting and evaluation

Subbasin
Clearwater

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
☒ Anadromous fish ☐ Resident fish ☐ Wildlife	☐ Multi-year (milestone-based evaluation) ☐ Watershed project evaluation	☐ Watershed councils/model watersheds ☐ Information dissemination ☐ Operation & maintenance ☐ New construction ☒ Research & monitoring ☐ Implementation & management ☐ Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description
8335000	Nez Perce Tribal Hatchery (8335000)
8335003	Nez Perce Tribal Hatchery Monitioring and Eval. (sub-proposal to 8335000)

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
8335000	Nez Perce Tribal Hatchery	Hatchery supplementation program being evaluated
8909800	Idaho Salmon Supplementation-IDFG	Collects necessary data in Crooked Fork Creek (NPTH M&E control stream)
8909801	Idaho Salmon Supplementation-USFWS	Collects data in Clear Creek (NPTH M&E coho treatment stream)
8909802	Idaho Salmon Supplementation-NPT	Relies on 8335003 for collection of

		ISS data in Newsome, Lolo, and Eldorado Creeks.
9403400	Assessing Summer and Fall Chinook Restoration in the Clearwater R. Subbasin	Currently conducts feasibility and status assessments of fall chinook salmon above Lower Granite Dam
9801004	M&E of Yearling Snake R. Fall Chinook Released Upstream of L. Granite Dam	Currently conducts M&E on fall chinook releases in the Clearwater River.
9607708	Lolo Creek Watershed Restoration	Providing improved habitat and 8335003 monitoring fisheries response
9607711	McComas Meadows Restoration	Providing improved habitat and 8335003 monitoring fisheries response
9607710	Eldorado Falls Passage Improvement	Removal of potential barrier and 8335003 monitoring fisheries response

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1993	Initiated ongoing baseline data (parr densities, juvenile emigration, spawning ground surveys)	Yes, Documenting life history characteristics and population abundance.
1993	Results of Meadow Creek Fish Trapping, Fall 1993 (Johnson 1993)	Yes, Life history and interspecific and intraspecific interactions.
1996	Completion of Monitoring and Evaluation Plan (Steward 1996)	This is a comprehensive ecosystem based monitoring and evaluation plan to assess interaction between supplemented and natural fish and presents a means to evaluate success of NPTH supplementation.
1995	Habitat condition report	Yes, Summary of current production potential knowledge
1996	Initiated adult escapement analysis (Lolo Creek)	Yes Reproductive success
1997	Results of Meadow Creek Fish Trapping for the 1995 Migratory year (Sprague and Johnson 1997)	Yes, Production potential, life history, Survival
1997	Steam Conditons and Salmonid Abundance - Meadow Creek (Selway)	Yes, Production potential
1997	Aerial Photograhps of Meadow Creek (selway) (Clearwater Biostudies)	Yes, Production potential

1997	Aerial Photograhps of Meadow Creek (selway)	Yes, Baseline production potential

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Coordinate M&E planning and implementation with the following agencies: BPA, IDFG, USFWS, USFS, NMFS, NPPC, CBFWA, CRITFC,BLM, COE.	a	Participate in the twice annual meetings between NPT,IDFG, and USFWS which plans for the production management of Clearwater Anadromous, Dworshak, Kooskia, and Rapid River hatcheries and outplanting from these facilities.
		b	Participate in the twice annual meetings of the Idaho Salmon Supplementation studies to coordinate NPTH efforts in monitoring baseline conditions and supplementation streams.
		c	Assist in obtaining permits for production or M&E requiring biological evaluation of effects.
		d	Complete three quarterly and an annual progress reports of all monitoring activities conducted by NPTH M&E staff.
		e	Participate in the annual Clearwater Basin Information Exchange meeting.
		f	Coordinate with NPT Production Division and other M&E projects.
2	Implement genetic resources monitoring plan.	a	Collect and analyze allelic, polygenic, and DNA data from hatchery and natural juveniles and adults for evidence of genetic differences between and temporal changes within hatchery and natural populations.
		b	Determine the potential for adverse effects resulting from exposure to unnatural selection pressures, increased inbreeding, outbreeding depression, and homogenization of formerly distinct gene pools.

		c	Determine whether supplemented populations are adapted or have the potential to adapt to local environments; use this information to control gene flow among populations and to evaluate hatchery broodstock selection, mating, rearing, and release practices.
		d	Coordinate data collection and analyses with other genetic monitoring programs currently underway in the Columbia River Basin.
3	Describe life history characteristics.	a	Compile and evaluate data on life history attributes (e.g., migration timing) of target species.
		b	Determine the geographical and temporal distribution of life history types from historical records.
		c	Delineate the spatial and temporal distributions of spawning, rearing, and migratory life stages of different life history types on maps and phenological (life cycle) charts.
		d	Identify environmental factors that appear to influence or covary with key life history traits.
		e	Determine whether desired life history traits can be cultivated through supplementation and maintained by the natural system, or whether external influences will prevent their expression.
4	Monitor population abundance.	a	Monitor the density of juvenile spring chinook and coho in permanent index reaches in selected treatment,control, and research streams.
		b	Operate juvenile (smolt) rotary screw traps on Lolo, Newsome, and Meadow Creeks; expand catch data to estimate juvenile production.
		c	Monitor adult escapement at Lower Granite Dam and at weirs in Lolo, Eldorado, Newsome, Meadow, Clear, Lapwai creeks, and in

			Potlatch and American rivers.
		d	Convert redd counts to spawner abundance by applying an appropriate fish-per-redd factor
		e	Monitor harvest by sport, commercial, and tribal fishermen.
5	Monitor survival of hatchery and natural chinook and coho salmon across different life stages.	a	Estimate progeny-to-adult ratios of coho and spring chinook from weired streams.
		b	Calculate the survival (Smith et al. 1994) of spring chinook smolts that are PIT-tagged as parr and overwinter either in NPTH streams or in mainstem areas.
		c	Compare survival across groups, years, and drainages.
		d	Estimate the proportion of hatchery spring chinook juveniles released into treatment streams that return to those streams as adults.
		e	Estimate parr-to-adult survival in study streams and smolt-to-adult survival in Lolo and Newsome Creeks
		f	Estimate adult-to-adult survival rates (i.e., spawner-recruit ratios) for both spring and fall chinook.
6	Monitor reproductive success.	a	Collect adult count and spawner survey data from selected experimental streams.
		b	Estimate stock productivity and derive empirical stock-recruitment relationships for chinook and coho populations.
7	Determine intraspecfic interactions.	a	Compare the relative abundance and/or growth of hatchery and wild chinook and coho parr and smolts in streams receiving fry and presmolt outplant.
		b	Redd surveys and trap sampling will be used to determine reproductive success of naturally spawning hatchery fish, and the prevalence of straying.
		c	Estimate straying rates for NPTH chinook and coho salmon based on

			recoveries of PIT and coded wire tags in adjacent streams, and hatcheries.
8	Monitor disease interactions.	a	Develop a long-term strategy for monitoring the incidence and effects of disease in fish affected by NPTH activities, and develop plans for responding to disease outbreaks, addressing critical uncertainties, and modifying fish health policies
		b	Assess the health of hatchery chinook and coho salmon in NPTH hatchery facilities.
9	Monnitor interspecfic interactions	a	Monitor short- and long-term changes in the relative abundance of competitor and predator fish species in NPTH streams.
10	Monitor water quanity and qualty in all study streams	a	Assemble historical streamflow and water quality data for NPTH streams.
		b	Identify flow exceedance values and flood and drought recurrence intervals.
		c	Measure stream discharge in treatment, research, and control streams at regular intervals over a range of flows. Correlate with streamflows in nearby gauged streams.
		d	Apply BURP protocols to monitor water quality in selected NPTH streams and mainstem reaches.
		e	Monitor stream temperatures continuously. Collect and analyze water quality data for significant spatial and temporal trends.
11	Describe production potential of all study streams.	a	Delineate, classify, and estimate the surface areas of NPTH stream reaches using aerial photographs, topographic maps, and habitat survey databases.
		b	Estimate and adjust chinook and coho salmon carrying capacity using the Smolt Density Model of the NPPC.
		c	Identify seeding levels appropriate

			for NPTH streams.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measurable biological objective(s)	Milestone	FY2000 Cost %
1	1/1993	12/2025		quarterly and annual reports	10.00%
2	7/1998	12/2025	Genetic structure	5 year reports	5.00%
3	7/1994	12/2025	life history characteristics	annual reports	4.00%
4	7/1994	12/2025	Current status and abundance trends	annual reports	40.00%
5	1/1996	12/2025	Survival by life stage	annual reports	17.00%
6	8/1997	12/2025	reproductive success	annual reports	2.00%
7	7/1993	12/2025	Hatchery:Natural Interation information	annual reports	2.00%
8	1/2000	12/2025	disease status and history	annual reports	5.00%
9	7/1993	12/2025	Intraspecific competion	annual reports	3.00%
10	1/1993	12/2025	Habitat suitability	5 year reports	7.00%
11	1/1993	12/2025	Carrying Capacity Estimates	5 year reports	5.00%
				Total	100.00%

Schedule constraints
Delays in construction of NPTH production facilities will limit abiltiy to apply and evaluate consist supplementation actions.

Completion date
ONGOING; Based on minimum supplementation period of 4 generations or 20 years. The monitoring and evaluation should accompany supplementation activities.

Section 5. Budget

FY99 project budget (BPA obligated): $820,562

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	8 full time regular employees, seasonal employees, administrative and management support	%39	385,014
Fringe benefits	24% taxed and 14% non-taxed	%7	65,590

Supplies, materials, non-expendable property	field supplies, equipment repair, lumber, radio tags, shop supplies	%2	23,801
Operations & maintenance	rent, communications, office supplies, training, computer services, copier lease	%3	25,802
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		%0	0
NEPA costs		%0	0
Construction-related support		%0	0
PIT tags	# of tags: 25,000	%7	72,500
Travel	GSA, field per diem, airfare, per deim	%8	77,146
Indirect costs	@22.9%	%13	132,214
Subcontractor	genetic analysis, disease monitoring, statistical and study design review, helipoter flights,	%8	82,880
Other	CWT detector, screw trap, weir, CWT materials and tagging costs	%13	127,900
	TOTAL BPA FY2000 BUDGET REQUEST		$992,847

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
		%0	
		%0	
		%0	
		%0	
	Total project cost (including BPA portion)		$992,847

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	$960,000	$1,010,000	$1,060,000	$1,110,000

Section 6. References

Watershed?	Reference
☐	Bowles, E. and E. Leitzinger, 1991. Salmon Supplementation Studies in Idaho Rivers. Experimental Design to the U.S. Department of Energy, Bonneville Power Administration. Project No. 89-098. Contact No. DE-

	BI79-89BP01466.
☐	Columbia River Inter-Tribal Fish Commission (CRITFC). 1995. Anadromous fish restoration plan: Wy-Kan-Ush-Mi-Wa-Kish-Wit: spirit of the salmon. Volumes I and II. Columbia River Inter-Tribal Fish Commission. Portland, Oregon.
☐	Cuenco, M.L, T.W.H. Backman, and P.R. Mundy. 1993. The use of supplementation to aid in natural stock restoration. In, Genetic Conservation of Salmonid Fishes, J.G., Cloud and G.H. Thorgaard, eds. Plenum Press, New York.
☐	Johnson, D.B. 1993. Results of Meadow Creek fish trapping, fall 1993. Nez Perce Tribe, Department of Fisheries Resources Management. PO Box 365 Lapwai, ID 83540.
☐	Johnson, D.B., R.E. Larson, and C.R. Steward. 1995. Supplement to the Nez Perce Tribal Hatchery Master Plan. Nez Perce Tribal Fisheries. Lapwia, ID.
☐	Johnson, D.B., R.E. Larson, and C.R. Steward. 1995. Supplement to the Nez Perce Tribal Hatchery Master Plan. Nez Perce Tribal Fisheries. Lapwai, Idaho.
☐	Larson, R.E. and L. Mobrand. 1992. Nez Perce Tribal Hatchery Master Plan and Appendices. Report to the U.S. Department of Energy, Bonneville Power Administration. Contract No. DE-A179-87-BP36809, Project No. 83-350.
☐	National Marine Fisheries Service. (NMFS) 1995. Proposed Recovery Plan for Snake River Salmon.
☐	Nez Perce Tribe and Idaho Department of Fish and Game. (NPT and IDFG) 1990. Columbia Basin System Planning. Salmon and Steelhead Production Plan. Clearwater River Subbasin. September 1, 1990. Prepared by the Nez
	Perce Tribe of Idaho and Idaho Department of Fish and Game. Prepared for the Northwest Power Planning Council and the Columbia Basin Fish and Wildlife Authority.
☐	Northwest Power Planning Council (NPPC). 1987. Columbia River Basin Fish and Wildlife Program. Portland, Oregon.
☐	Nothwest Power Planning Council. (NPPC) 1994. 1994 Columbia River Basin Fish and Wildlife Program. Northwest Power Planning Council, Portland, OR.
☐	Pacific Northwest National Laboratory Ecology Group. 1997. A review of "Response to Questions for the Three-Step Process Review of the Nez Perce Tribal Hatchery". Document prepared for Northwest Power Planning Council Staff dated December 5, 1997.
☐	Regional Assessment of Supplementation Project (RASP). 1991. Draft status report for review and comment. Prepared for Bonneville Power Administration PJSP, Portland, Oregon.
☐	Smith, S.G., J.R. Skalski, J.W. Schlechte, A. Hoffman, and V. Cassen. 1994. SURPH.1 Manual. Statistical survival analysis for fish and wildlife tagging studies. Developed for the Bonneville Power Administration. University of Washington, Center for Quant
☐	Sprague, S.C. and D.B. Johnson. 1997. Results of Meadow Creek fish trapping, 1994. Nez Perce Tribe, Department of Fisheries Resources

	Management. PO Box 365 Lapwai, ID 83540.
☐	Sprague, S.C. and D.B. Johnson. 1997. Results of Meadow Creek fish trapping for the 1995 migratory year. Nez Perce Tribe, Department of Fisheries Resources Management. PO Box 365 Lapwai, ID 83540.
☐	Steward, C.R. 1996. Monitoring and evaluation plan for the Nez Perce Tribal Hatchery. Nez Perce Tribe Department of Fisheries Resources Management, Lapwai ID. Prepared for the U.S. Department of Energy, Bonneville Power Administration. Contract No.87B1368

PART II - NARRATIVE

Section 7. Abstract

The Nez Perce Tribe has been authorized to build and operate the Nez Perce Tribal Hatchery (NPTH;8335000) for the purpose of restoring self-sustaining chinook and coho salmon to their ancestral habitats in the Clearwater River Basin. Approximately 3.6 million chinook and coho fry would be propagated annually in a variety of culture facilities located throughout the Basin. These fish would be released into tributaries and mainstem reaches of the Clearwater with the expectation that they would emigrate to the ocean and return as adults to spawn naturally. Hatchery propagation techniques and release strategies have been designed to promote wild-type characteristics, minimize genetic divergence or loss of diversity in hatchery and wild chinook populations, and minimize undesirable ecological interactions. Beginning with this fiscal year proposal, the NPTH M&E program is assigned a separate BPA Project Number, 8335003.

A monitoring and evaluation plan was developed and implemented to evaluate the effects on hatchery and wild populations of chinook and coho of building and operating the NPTH facilities, collecting wild fish for broodstock, rearing progeny at the hatchery using innovative culture practices and natural stimuli, and releasing hatchery-reared fish at various times and places in the watershed using a variety of outplanting techniques (Steward 1996). The major goals of the M&E program are to evaluate the effectiveness of supplementation, to monitor changes in the environment that are causally linked to supplementation, to provide information on the capacity of the natural environment to assimilate and support supplemented salmon populations, and to give early warning of changes in environmental quality and management policy that may affect the project's success.

All monitoring and evaluation activities have been justified by reference to critical uncertainties, defined as project-related assumptions that, if invalid, have the potential to cause undesirable ecological or economic impacts. Approximately 30 performance variables have been identified which, when monitored over time and space, will provide the information necessary to resolve key project uncertainties and enable informed decision-making. We assigned highest priority to demographic, life history, and genetic variables. Other key variables include those which enable evaluation of environmental quality, habitat carrying capacity, ecological interactions with resident fish and other biota, and the effects of certain non-project management activities.

Implementation of this proposal will ensure that the NPTH remains a dynamic and responsible tool for managing the region's fisheries resources for the benefit of society.

Section 8. Project description

a. Technical and/or scientific background

In the 1987 and 1994 Fish and Wildlife Programs, the Northwest Power Planning Council directed the Nez Perce Tribe to prepare design and construction plans for a hatchery complex to be situated in the Clearwater River Basin of Idaho. The Nez Perce Tribal Hatchery was authorized for the purpose of restoring self-sustaining populations of spring and fall chinook in the Basin. The project comprises a combination of spawning, incubation, and rearing facilities; satellite rearing and acclimation facilities; juvenile and adult collection sites; and associated production, harvest management, and monitoring, evaluation, and research activities. See umbrella proposal 8335000.

The NPTH will be used to reintroduce and augment salmon populations in the Clearwater River, consistent with NPPC program priorities and salmon recovery goals for the Columbia River. As currently conceived, the NPTH program will produce approximately 768,000 spring chinook (stream type) parr and 2,800,000 fall chinook (ocean type) subyearling smolts on an annual basis.

In 1998, the NPPC recommended an amendment to the NPTH Master Plan to address production of coho salmon. Approval of this amendment initiates the Three-Step process for coho supplementation to occur under the auspices of NPTH. It is anticipated that the Master Plan amendment will be completed in 1999, which will then require the first level of review in the Three-Step process. Should it be determined after master planning, NEPA and final design analysis that NPTH production of coho is desirable, then the existing program would be amended to fund the new production. This proposal is submitted assuming that coho production under NPTH would occur sometime in the year 2000.

The recent history of ESA listings and the public controversy surrounding hatcheries have forced planners to continually revise the NPTH program to conform to best available science and pubic values. In response to changing environmental conditions, new scientific information, and evolving policy and legal concerns, the Tribe has undertaken additional planning, coordination and monitoring activities in an adaptive management framework. The monitoring and Evaluation (M&E) plan for NPTH has been praised for its comprehensive nature and discussion. The Independent Review (PNNL 1997) found that "…The document that best illustrates the NPT commitment to ecologically sound operation is the Monitoring and Evaluation Plan." They found that "…The project assumptions for all issues are clearly stated and documented. The critical uncertainties are listed and risk levels for each uncertainty is documented. Performance criteria variables are listed and explained. Experiments and monitoring plans are explained for every issue. Protocols for these activities are described in the plan." The M&E plan can be an extremely useful prototype for other supplementation efforts undertaken in the Columbia Basin, in addition to being used to guide efforts of the NPTH.

The NPTH M&E Plan (Steward 1996) was developed so that Tribal managers would be able to determine (1) which supplementation strategies work best under existing and future conditions, (2) whether supplementation actions resulted in the establishment and increase of salmon populations, and (3) whether adverse ecological impacts were avoided.

Monitoring needs, procedures, and priorities for the NPTH program were identified by reference to program goals, objectives, critical uncertainties, and cost and technical constraints. Managers recognized that the project entails a certain degree of risk due to the uncertainty of our assumptions and the unpredictable consequences of our actions. A risk assessment procedure was developed and applied to identify critical uncertainties and hypotheses that could be addressed through monitoring and evaluation. Project-related assumptions and actions were carefully evaluated to expose any conceptual inconsistencies or information gaps, to characterize associated risks, and to identify ways in which those risks could be avoided or minimized. The goal of monitoring and evaluation, when coupled with adaptive management, is to reduce or eliminate the uncertainty associated with high risk assumptions/actions so that undesirable ecological or economic impacts can be avoided. If evidence suggests that an assumption is invalid or an action is attended by unacceptably high risk, either the assumption or the NPTH program will need to be revised.

Project M&E activities were organized hierarchically by Category of Impact, Subcategory, and Performance Criterion. The Stock Status category refers to targeted populations (i.e., hatchery and wild components of the supplemented population) and comprises genetic, life history, and population viability monitoring activities directed primarily at detecting genetic and life history differences between wild and hatchery fish, and changes in population characteristics over time.

Many of the biological processes that can be expected to affect stock status will be investigated under the Ecological Interactions category, which includes intraspecific and interspecific interactions (i.e., competition, reproduction, predator-prey, and pathogen-host interactions) between hatchery and wild populations and other species.

The third category, Natural Environment, comprises assumptions and monitoring activities concerned with the effect of NPTH actions on the overall health of the natural system, as indexed by its biological diversity and the status of threatened and endangered species. This category also refers to natural processes and human activities that might affect project success or moderate its impact on the environment. Included in this category are natural factors and human influences that could potentially limit the survival and abundance of wild and hatchery fish. We distinguish between factors affecting the capacity of the system to support salmon, such as streamflow, water quality, and habitat quantity and quality, and “extrinsic factors”, defined as environmental disturbances or management decisions that could potentially affect population status and project viability over the long-term. Examples include natural disturbances such as fire, the presence of federally protected species, hydrosystem operations, and other human activities.

Associated with each subcategory are two or more performance criteria (indicators), which are features, attributes, or processes that are both measurable and, with regard to supplementation, have assessment value. Performance criteria include biological indicators such as population abundance and interspecific competition, and non-biological indicators such as streamflow and water quality.

For each performance criterion, one or more performance variables were selected to provide reliable measures of indicator status. Performance variables are the actual parameters that will be measured to monitor progress toward meeting program goals, to assess project impacts, and to detect background changes in the environment. For example, to monitor changes in salmon population abundance, we recommended that returning adults be enumerated at Lower Granite Dam, stream weirs, and hatchery racks. Other measures of abundance include parr densities, smolt yield, redd counts, and harvest.

Inferences regarding the success of coho supplementation will be less tenuous than those made for spring and fall chinook, as long as all hatchery-produced coho receive an identifiable mark. Adult coho returns to Lower Granite Dam, separated into hatchery and natural lots, will be used to evaluate NPTH program effectiveness for this species.

A large-scale field experiment is already underway in the Clearwater Basin to determine whether supplementation has led to significant increases in spring chinook populations. The experimental design requires that pairs of treatment (supplemented) and control (unsupplemented) streams be repetitively sampled before and after the hatchery begins operation. The response variable of interest is the number of spring chinook spawners counted each year at adult collection weirs located near the mouths of the treatment and control streams. Data collected on populations before and after project startup will be compared to test for an effect due to supplementation.

Fall chinook pose a unique challenge due to the difficulty of obtaining accurate estimates of juvenile and adult abundance and the lack of opportunity for experimental (spatial) replication. We propose to evaluate the performance of fall chinook on the basis of yearly redd counts in the Clearwater Basin and by estimating the fraction of Clearwater sub-subbasin bound fish passing Lower Granite Dam. A steady increase in fall chinook escapement will be taken as evidence for supplementation success.

Potential effects of supplementation on wild salmon and other aquatic biota will be evaluated through observational and correlational data collected under the M&E Plan. Information of this type does not always give a clear picture of cause-and-effect relationships. However, observational and correlational data can provide greater understanding of the processes and conditions that influence the observed response, and they can suggest testable hypotheses about project effects.

A total of 83 performance variables were originally identified in the M&E Plan based on their scientific validity, ease of measurement, and relevance to project objectives and critical uncertainties. For each variable, the M&E Plan describes why it was selected, how and when it is to be measured, the units (fish, sites, streams, etc.) to be sampled, and the analytical procedures to be applied to the data. It also indicates where opportunities exist for integrating NPTH M&E activities with ongoing federal and state monitoring programs.

The M&E report provides guidelines for prioritizing M&E activities according to their relative importance and cost. The tasks and subtasks outlined in Methods section of this proposal would provide information on approximately 30 high priority performance variables. Highest priority is assigned to Genetic Resource, Population Abundance, and Survival performance criteria. Also targeted are indicators that facilitate evaluation of

stream carrying capacities, disease interactions, impacts on resident fishes, and the potential effects of non-project management activities on project decisions and outcomes.

b. Rationale and significance to Regional Programs

In the 1994 Fish and Wildlife Program (NPPC 1994), NPTH specifically addresses Measure 7.4M (inclusive), which calls for the development and construction of Nez Perce Tribal Hatchery. NPTH also specifically addresses Measure 7.5.B.1, which recommends supplementation of Snake River fall chinook, and is one of 15 high priority supplementation projects identified in Measure 7.3.B.2. More generally, NPTH relates to Program measures 2.1, 2.2A, 4.1, 7.4C.1, 7.4F.

The monitoring and evaluation objectives and tasks defined in this proposal implements Measures 7.4B, which calls for application of the Regional Assessment of Supplementation (RASP) to evaluate supplementation projects in the Columbia River. They also address FWP program measures, critical uncertainties, and performance standards found in Sections 3.2, 4.3, 4.3.B, 4.3.C, 5.5, 5.5.A, 7.1, 7.1A, 7.1B, 7.1C, 7.1G, 7.1H, 10.5, 10.6, and 10.6.A.

The NMFS draft recovery plan states that "captive broodstock and supplementation programs should be initiated and/or continued for populations identified as being at imminent risk of extinction, facing severe inbreeding depression, or facing demographic risks."

This project relates to a number of measures in the Snake River Recovery Plan (NMFS 1995a). Measure 4.1.d says to "Develop planning, implementation and implement management plans for Snake River fall chinook salmon gene bank and conservation programs". NPTH will be supplementing listed fall chinook salmon in the Clearwater River. Measures under 4.4 (Improving survival of Columbia River Basin anadromous salmonids by improving quality of fish released from hatcheries) are all addressed by rearing techniques proposed for NPTH. Ecological interaction studies described in Measure 4.5.c. are a focus of NPTH M&E Plan (Steward 1996). And finally, the genetic risk assessments developed for NPTH have researched the origin of the Clearwater runs and identified appropriate stocks to use for supplementation by NPTH (Measure 4.7.d).

Wy-Kan-Ush-Mi- Wa-Kush-Wit: Volume I: 5B–14-22; Volume II: 2-118-127 (CRITFC 1995) recommends "Implement supplementation projects that have met the screening criteria of RASP (1992) and Cuenco et al (1993)", which includes NPTH. It also recommends, "Establish additional programs for each of the subbasin tributary systems to monitor adult escapement and resulting smolt production, and to evaluate (by measuring the number of adults returning) the ability of managers to meet goals set by the Columbia River Management Plan" NPTH M&E protocol will do so.

The Clearwater River Subbasin Plan (NPT and IDFG 1990) also recommends completion of NPTH in its efforts to restore natural spawning populations. Recommendations for spring, summer and fall chinook salmon all depend on implementation of NPTH.

c. Relationships to other projects

This project (8335003) is the monitoring and evaluation program for spring chinook and coho salmon production and is sub-proposal under the Nez Perce Tribal Hatchery project (8335000). Fall chinook salmon production and M&E above Lower Granite Dam is currently facilitated by several agencies and BPA projects. The completion of NPTH construction will consolidate several of those projects under one production and M&E program. Monitoring and evaluation of fall chinook is briefly discussed in this proposal, however no funding will be associated with those task until FY 2001.

NPT projects 9403400 and 9801004 are two components of a fall chinook umbrella proposal that includes research, monitoring and evaluation, and production of fall chinook salmon. These projects are establishing the baseline information and will be used as the framework for NPTH M&E of NPTH fall chinook production. Project 9403400 is assessing fall chinook spawning habitat availability and quality, juvenile life history characteristics and emigration in production areas above Lower Granite Dam. Project cooperation includes: describing juvenile life history characteristics of wild and Lyons Ferry Hatchery supplemented fall chinook, emigration survival as it relates to environmental conditions, and conducting fall chinook aerial redd surveys and documenting hatchery fish contributions to the natural spawning population. BPA projects 9102900, 9403400, and 9801004 all estimate survival of different groups of emigrating fall chinook from either point of release for hatchery fish or point of capture and release for natural fish down to the lower Snake River dams.

The Idaho Salmon Supplementation (ISS) (Bowels and Leitzinger 1991) projects (8909800, 8909801, 8909802 and 8909803) are designed to evaluate the long term usefulness of supplementation as a recovery/restoration strategy for depressed stocks of spring and summer chinook salmon in Idaho. NPTH is scheduled for providing a portion of the prescribed treatments under the ISS study design. NPTH M&E has been and will continue coordination with project 8909802 to collect the require ISS data (adult escapement, juvenile emigration, etc) in Lolo, Eldorado, and Newsome creeks.

This project provides monitoring and evaluation of the fisheries resources effected by other Nez Perce Tribal fisheries program projects. These include ongoing watershed improvement projects for Lolo Creek watershed (9607708), Eldorado falls (9607710), and McComas Meadows (9607711); and proposed projects for Newsome, Mill, and Lapwai creeks . These systems are either scheduled as “treatment” or “control” streams for NPTH M&E, or will be used as production areas when carrying capacity of supplementation streams are limited (see Appendix F of BPA et al 1997. Other NPT supplementation projects (Johnson Creek, NEOH, Fall Chinook Acclimation) will benefit by knowledge gained while implementing NPTH. The M&E Plan for NPTH (Steward 1996) will also form the basis for much of the monitoring and evaluation to occur with these supplementation projects.

d. Project history (for ongoing projects)

The NPTH program has always been assigned BPA Project Number 8335000 and has included funding and contracting for two different components: the Planning & Pre-

design, and M&E programs. However, beginning with this fiscal year proposal, the NPTH M&E program will be assigned a separate BPA Project Number, 8335003.

Field sampling under the NPTH M&E program began in 1993 with the release of 100,000 hatchery-reared fingerling chinook salmon into Meadow Creek, tributary to the Selway River. An experiment was conducted to determine whether different environmental conditions and dispersal techniques affected the relative abundance of spring chinook and resident fish in the vicinity of release sites. Habitat use and interspecific interactions were also monitored. Outplanting resulted in a significant increase in late summer densities of juvenile salmonids in Meadow Creek, especially in upper reaches where older resident rainbow and cutthroat trout were uncommon, but that survival to adult return was generally poor. Juvenile chinook tended to congregate in pool habitats, even in the presence of predatory trout.

Juvenile chinook salmon were caught in a rotary screw trap in lower Meadow Creek as they emigrated in the fall and spring. Trap data provided information on species composition, migration timing, relative survival, and growth in the natural environment.

In 1994, 400,000 spring chinook salmon parr were released into Meadow Creek. Sites that had served as controls in the previous year received fish (i.e., treatments were "crossed"). Fish densities were measured in different habitat types at different time intervals following release. Results from the preceding year were corroborated. Several other streams also received outplants in 1994 following guidelines for supplementation described by Johnson et al. (1995). Baseline data collection, including underwater visual estimates of juvenile densities and redd counts in the index reaches, was initiated in spring chinook "treatment" streams. Juvenile emigrants were monitored in Meadow Creek and Lolo Creek using rotary screw traps.

Baseline sampling of treatment streams continued in 1995, 1996, and 1997. Surplus spring chinook adult salmon and eyed eggs were outplanted in 1997. Sampling was expanded to include several "control" streams in 1997. Data included baseline parr density estimates, adult counts at weirs situated on Lolo Creek, Meadow Creek and Newsome Creek, expanded redd counts, and juvenile emigration timing and relative abundance. Aerial photographic coverage and synoptic stream surveys were completed on Meadow Creek.

Sampling activities in 1998 continued to focus on spring chinook treatment and control streams. Spring chinook parr were released into several streams. Data were obtained through operation of screw traps in Meadow Creek, Newsome Creek, and upper and lower Lolo Creek, baseline snorkel counts, operation of adult salmon weirs (Lolo Creek, Eldorado, Creek and Newsome Creek), and redd counts. Aerial photographic coverage has been obtained for Meadow Creek.

To date, several project reports pertaining to Meadow Creek and Lolo Creek sampling, Meadow Creek stream survey, and biological assessments for ongoing outplanting activities have been completed.

e. Proposal objectives

The objectives identified below were derived from NPTH Program goal statements made in NPTH planning documents, and are more completely elaborated in

the NPTH M&E Plan (Steward 1996). M&E needs and priorities were defined by reference to project objectives and associated critical uncertainties (hypotheses).

Objective 1. Coordinate M&E planning and implementation with the following agencies: BPA, IDFG, USFWS, USFS, NMFS, NPPC, CBFWA, CRITFC,BLM, COE.

Overall NPTH program coordination involves the following activities: engineering design, construction, monitoring and evaluation, research, and fish culture.

Objective 2. Implement genetics resources monitoring plan.

Compile existing genetic and life history data on chinook and coho populations; collect allozyme and DNA data necessary to monitor changes in genetic identity, including genetic diversity and life history variability, in hatchery and wild populations over the long-term; define the ancestral relationship between Clearwater and other Columbia Basin populations; and assess and revise, if necessary, management policies and practices to accommodate new information and to achieve the stated genetic goals.

Objective 3. Describe life history characteristics.

Describe the diversity, distribution, and ecological/phenotypic characteristics of different chinook and coho life history types formerly and currently extant in the Clearwater River system; compare the life history requirements to the availability of critical habitats and resources; and devise supplementation strategies and management actions to promote and maintain life history diversity.

Objective 4. Monitor population abundance.

Monitor the abundance of chinook and coho populations by measuring parr densities, smolt numbers, adult escapement to stream weirs and hatcheries, redds, and sport, commercial, and tribal harvest. Trends in annual abundance will serve as the primary measures of stock status and, by inference, project success.

Objective 5. Monitor survival of hatchery and natural chinook and coho salmon across different life stages.

Monitor the survival of hatchery and wild chinook and coho salmon across different life stages as a prerequisite to devising management strategies designed to mitigate or eliminate sources of mortality and to maintain population viability and harvest options.

Objective 6. Monitor reproductive success.

Monitor the reproductive success of naturally spawning chinook and coho salmon populations. Determine reproductive success of naturally spawning hatchery chinook and coho, their interactions with wild stocks, and the prevalence of straying.

Objective 7. Determine intraspecific interactions.

Determine whether intraspecific competition is an important factor regulating chinook and coho salmon production in NPTH streams, as indexed by changes in relative abundance of hatchery and wild juveniles following release.

Objective 8. Monitor disease interactions.

Working with fish health specialists from the Dworshak Fish Health Center, collect data to establish background levels of important disease agents known to

affect chinook and coho salmon populations. If possible, determine whether viral, bacterial, and parasitic diseases have been transmitted from hatchery to wild fish, and vice versa. Should a disease epizootic occur, conduct intensive sampling to determine its effects on hatchery and wild salmon.

Objective 9. Monitor interspecific interactions.

Monitor abundances of competitor and predator species and determine whether they are correlated with chinook or coho salmon abundance or survival.

Objective 10. Monitor water quantity and quality in all study streams.

Monitor and evaluate the effects of water quantity and quality, notably stream discharge and water temperature, on the production potential of NPTH streams.

Objective 11. Describe production potential of all study streams.

Determine how many juvenile chinook and coho salmon can be produced, on average, by NPTH streams under historical, present, and anticipated future conditions; use this information to refine hatchery and stream production goals and to identify alternative mitigation and enhancement measures.

f. Methods

The methods, tasks, and subtasks are organized by project objective. They describe the activities and flow of information required to monitor project status and evaluate critical uncertainties (hypotheses) during FY2000. Further detail is provided in the NPTH M&E Plan (Steward 1996). All Study streams (treatment, research, and controls) are with-in the Clearwater River sub-basin and include: Lapwai Creek, Potlatch River, Lolo Creek, Eldorado Creek, Mill Creek, Meadow Creek (South Fork Clearwater), Newsome Creek, Clear Creek, Meadow Creek (Selway), Fish Creek, Boulder Creek, Warmsprings Creek, and Crooked Fork Creek.

Objective 1. There are many entities involved in the project and their participation is crucial. Funding and oversight is through BPA. Besides the NPT and BPA, other entities involved in the project include IDFG, USFWS, USFS, NMFS, NPPC, CBFWA, CRITFC, BLM and the COE. Obtaining permits for production or M&E requiring biological evaluation of effects, report preparation, and presentations are a vital element of evaluation and coordination of the NPTH M&E project.

Objective 2. Identifying the population structure and monitoring key life history and genetic characteristics of salmon populations found in the Clearwater basin and populations to be used as broodstock for the NPTH are essential components of the long-term management and recovery of those populations. The genetics monitoring program is designed to evaluate the effects of introducing hatchery-reared chinook and coho salmon, obtained from both out-of-basin and in-basin sources, on natural populations of salmon in the Clearwater River Basin. We plan to work with Dr. Madison Powell of the University of Idaho to apply allozyme and DNA analysis to evaluate genetic relationships, variability, and adaptedness among hatchery and natural salmon.

Allozyme and DNA data will be collected to evaluate genetic relationships among hatchery and natural componets and to monitor genetic changes occurring in both groups. The proposed design and methodology will conform to and augment genetic sampling

programs already underway in the Clearwater sub-basin and elsewhere in the Columbia River basin. Specifically, we propose to collect and analyze allelic, polygenic, and DNA data for evidence of genetic differences between and temporal changes within hatchery and natural populations; determine the potential for adverse effects resulting from exposure to unnatural selection pressures, increased inbreeding, outbreeding depression, and homogenization of formerly distinct gene pools; determine whether supplemented populations are adapted or have the potential to adapt to local environments; use this information to control gene flow among populations and to evaluate hatchery broodstock selection, mating, rearing, and release practices.

Yearly samples will be taken from chinook and coho salmon hatchery stocks and from natural populations. Pre-smolt, smolt, and adult samples will be collected from hatchery facilities and from field collections, using non-lethal sampling techniques to the extent practicable. Sub-samples will be taken from several locations and/or times to ensure representative population samples.

Objective 3. Virtually all salmonid species exhibit a diversity of life history types and adaptive traits that allow the population to persist in unstable environments. Under a supplementation program such as NPTH, it makes sense to identify and to replicate as much as possible the various life stage-environment combinations which comprise the fully integrated system. In order to prioritize sampling efforts and to determine whether this objective is being met, several performance variables and related sampling activities have been identified.

Compile and evaluate data on life history attributes (e.g., migration timing) of target species. Describe the amount, type, and significance of intrapopulation variation in key life history attributes. Determine the geographical and temporal distribution of life history types from historical records. Delineate the spatial and temporal distributions of spawning, rearing, and migratory life stages of different life history types on maps and phenological (life cycle) charts. Identify environmental factors that appear to influence or covary with key life history traits. Determine whether desired life history traits can be cultivated through supplementation and maintained by the natural system, or whether external influences will prevent their expression.

Objective 4. Demographic performance variables, because they are less ambiguous and can be measured with relative ease and precision, are far better indicators of stock status than is information on the magnitude and distribution of genetic and phenotypic (life history) variability. Changes in abundance, survival, reproductive output, and long-term fitness reflect responses to supplementation at the population level, and for this reason the performance variables which permit such assessments have received special emphasis.

We will continue to monitor the density of juvenile spring chinook and coho (and other salmonid species, see objective 9) in permanent index reaches in selected treatment and control streams. Integrate with existing data on parr densities, sampling methods, and related research conducted by other agencies. Operate juvenile (smolt) rotary screw traps on Lolo, Newsome, and Meadow Creeks; expand catch data to estimate the number of juvenile coho and spring chinook salmon emigrating during fall and spring from those streams. Count hatchery and natural coho and spring chinook adults passing Lower Granite Dam and returning to temporary or existing permanent weirs located on Lolo,

Eldorado, Newsome, Meadow Creek (Selway), American River, Lapwai Creek, Potlatch River, and Clear Creek. Convert redd counts to spawner abundance by applying an appropriate fish-per-redd factor. Monitor harvest by sport, commercial, and tribal fishermen.

Objective 5. If the NPTH is to succeed, relatively high survival rates need to be maintained, since stock productivity is a direct function of survival. A combination of genetic conservation and environmental management practices will be employed to maintain high survival in the hatchery and confer high fitness in post-release environments. M&E activities are defined to estimate the survival of hatchery and wild chinook and coho salmon following release as parr and pre-smolts, during smolt and adult migration periods, and over their entire life cycle.

Estimate progeny-to-adult ratios, N_2 / N_1, of coho and spring chinook from weired streams. Calculate the survival (Smith et al. 1994) of spring chinook smolts that are PIT-tagged as parr and over-winter either in NPTH streams or in mainstem areas. In Lolo Creek and Meadow Creek, PIT-tag 1500 – 2000 spring chinook parr captured in rearing areas during the late summer. PIT tag another 2000 fish captured in lower tributary smolt traps in the fall. Compare survival across groups, years, and drainages. Expand PIT tag marking program and survival studies to other NPTH streams as warranted. Estimate the proportion of hatchery spring chinook juveniles released into treatment streams that return to those streams as adults. For wild fish, estimate parr-to-adult (all streams) and smolt-to-adult (Lolo and Newsome creeks) survival. Calculate parr-to-adult survival rates for wild fish as the percentage of parr that survive to adulthood, as determined from parr abundance estimates and adult counts at weirs. Smolt-to-adult survival rates may be calculated by estimating smolt production from parr abundance estimates adjusted downwards to account for over-winter mortality. Estimate adult-to-adult survival rates (i.e., spawner-recruit ratios) for both spring and fall chinook and after a suitable period, derive Ricker stock-recruitment curves for the Clearwater River Basin and its component populations. Fit and evaluate Ricker stock-recruitment curves to adult escapement data collected over a period of years; use the relationships to predict the number of recruits expected for a range of spawner abundances and to calculate optimum spawning stock size (i.e., that which maximizes the long-term harvestable surplus).

Objective 6. Reproductive success will be indexed by (1) the proportion of returning adult salmon that actually spawn, as indexed by the number of redds (and spawners) counted in streams for which weir counts are available, (2) the ratio of surviving progeny (recruits) produced per parental spawner, and (3) the proportion of fish that stray to other areas. Our ability to detect strays will require that hatchery fish receive unique marks and that personnel be able to recapture and accurately count or estimate numbers of marked and unmarked fish.

Objective 7. In our evaluation of intraspecific interactions, we focus on short-term shifts in distribution and abundance caused by the direct interaction of hatchery and wild salmon. We also emphasize the need to monitor the potential for genetic exchange with other chinook spawning aggregates, as measured by the number of fish that stray into other drainages (see the preceding Objective 6).

Compare the relative abundance and/or growth of hatchery and wild chinook and coho parr and smolts in streams receiving fry and presmolt outplants. Redd surveys and trap sampling will be used to determine reproductive success of naturally spawning hatchery fish, and the prevalence of straying. Estimate straying rates for NPTH chinook and coho salmon based on recoveries of PIT and coded wire tags in adjacent streams and hatcheries.

Objective 8. The goal of disease monitoring is to collect data which allow assessment of changes in natural and hatchery population status that can reasonably be attributed to pathogens. Major concerns are the prevalence and progression of disease among hatchery fish, the horizontal transmission of disease from hatchery to wild fish, and the extent of mortality attributable to disease agents. We would like to be able to predict fish performance and survival based on our understanding of fish health and environmental interactions. By joining the National Wild Fish Health Survey, the Tribe seeks to conform to accepted diagnostic and data management standards and, in doing so, provide a better basis for management decisions regarding hatchery practices and stocking activities.

We have arranged to have fish pathologists from the Dworshak Fish Health Center help us identify and sample target populations and pathogens, develop a long-term strategy for monitoring the incidence and effects of disease in fish affected by NPTH activities, and develop plans for responding to disease outbreaks, addressing critical uncertainties, and modifying fish health policies. Dworshak Fish Health Center personnel would be specifically responsible for diagnostic services, INAD services, veterinary services, histological services, and pre-release exams, both onsite and in the laboratory, as appropriate. All sampling, diagnostic, and statistical analyses will conform with NWFH Survey protocols and procedures.

Routinely assess the health of hatchery chinook and coho salmon in NPTH hatchery facilities, with special attention given to returning adults to and to juveniles immediately prior to release.

Objective 9. Interspecific competition will be evaluated by measuring long-term changes in species distribution and abundance in supplemented and non-supplemented streams. Because steelhead trout, cutthroat, and bull trout are important competitors and/or predators of chinook and coho salmon, they will receive the greatest attention.

Determine whether localized increases in chinook and coho salmon abundance are accompanied by corresponding decreases in the relative abundance of competitor and predator fish species. Monitor short- and long-term changes in the relative abundance of competitor and predator fish species in NPTH streams in conjunction with ongoing parr monitoring studies. Determine whether these changes are correlated with supplementation activities.

Objective 10. The amount and timing of water entering a stream influences the structure and texture of the channel, the physical and chemical characteristics of the fluid medium, and therefore the biological forms and processes occurring within the stream. We propose to assemble historical streamflow data to identify both short- and long-term, seasonal and inter-annual, variations in precipitation and discharge. The NPT will also coordinate with

Idaho DEQ to implement Beneficial Use Reconnaissance (BURP) protocols to measure water quality parameters as part of a comprehensive water quality monitoring program underway in the state. Correlations between with stream carrying capacity, productivity, and water quantity and quality parameters will be sought.

Assemble historical streamflow and water quality data for NPTH streams. Identify flood and drought recurrence intervals. Look for trends attributable to human activities. Measure streamflows in treatment and control streams at regular intervals over a range of flows. Correlate with streamflows in nearby gauged streams. Examine the effects of streamflow on salmon movement, survival, etc.

Apply BURP protocols to monitor water quality in selected NPTH streams and mainstem reach. Monitor stream temperatures continuously. Collect and analyze water quality data for significant spatial and temporal trends. Describe habitat suitability as a function of water quality for each species/life stage in all production areas.

Objective 11. Chinook and coho salmon production potential will be estimated for NPTH streams by applying habitat and reach typing, mapping, and sampling techniques to selected study areas. Delineate, classify, and estimate the surface areas of NPTH stream reaches using aerial photographs, topographic maps, and habitat survey databases. Adjust reach quality ratings, parr densities, and parr-to-smolt survival rates as necessary. Estimate chinook and coho salmon carrying capacity using the Smolt Density Model of the NPPC. Calculate stream carrying capacities under existing conditions by replacing mean chinook densities with maximum densities (either observed or reported in the literature) in the preceding calculations. Compare results and identify seeding levels appropriate for NPTH streams.

g. Facilities and equipment

This project is based out of the Nez Perce Tribal, Orofino Fisheries Field Office which is shared with other BPA funded projects. This field office is adequately suited for the project. It includes: an 8 room office building with break room, 2- storage buildings, a 40' x 60' shop, car port, and a fenced compound.

The project has six leased GSA fleet trucks, three of which are four wheel drive with towing packages. The vehicles are mainly used in the field for transporting personnel to and from the work site and equipment transportation. Currently the vehicles are meeting our demand but we have requested another truck for the additional biologists that will start in 1999. There are two ATV's and two snowmobiles for use off road or in extreme weather conditions. The project has three travel trailers for use at the weir/screw trapping sites where 24-hour shift coverage is needed.

The project currently has two personal computers, one laptop computer, scanner, printer, digital camera, and digital projector. One of the computers are scheduled for an upgrade in 2000. Most of the computer equipment is shared among all the BPA funded projects.

There are two PIT tag stations. These two tagging stations should be sufficient for our field and hatchery tagging needs. 24 hours of Helicopter time is scheduled for

snorkeling and redd counts, this is currently what we use and it is sufficient to cover our tasks.

One coded wire tag detector ($6,000). We currently have two CWT detectors but there is a need for three. We currently operate three weir sites, a third detector would allow us to check all the adults, and juveniles that are trapped at each weir/screw trap site.

One Screw Trap 5' - ($12,000). We currently have 6 traps, four of which are used in lower Lolo Creek, upper Lolo Creek, Newsome Creek and Meadow Creek. Two of the traps are used as backup traps. Over the past four years we have lost a lot of trapping days due to damaged traps that were in the repair shop. Traps are usually damaged during high flows in the spring, the same time as major fish movements. The new trap would replace the oldest trap in our inventory, a trap that has been in continues use from 1993.

One Weir - ($30,000) An additional stream has been added to our adult collection sites, a weir is needed to capture adults as they return to their spawning grounds. This weir would be a light weight aluminum construction that has proven itself in many other projects. It is very easy to set up and requires less manpower to install.

h. Budget

Personnel

Personal needs include the following; Project Leader - 1 FTE, Assistant Project Leader - 2 FTE, Fisheries Tech II - 1 FTE, Fisheries Technician I - 3 FTE, Fisheries Aides (13 - temporary) 17 to 22 pay periods. The only new addition in personnel costs from 1999 to 2000 is the addition of a biologist position and one pay period for administrative support (Fisheries Research Coordinator). All other increases are to accommodate salary increases.

Fringe Benefits

The NPT has a significant number of tribal members employed in the DFRM who are tax exempt status. This is the reason for two different fringe benefit rates (24% and 14%).

Supplies, Materials, Non-expendable Property

Field materials funding includes such items as rain gear, wetsuits, waders, wading boots, cable, clamps, rope, paint, etc. Radio transmitters are needed for tracking returning adults over Lower Granite Dam. Shop lockers are for storing equipment issued to each employee. Repairs and maintenance are to fix damage to screw traps, weirs and other field equipment.

Operations and Maintenance

Training costs have remained the same from 1999. Training will include first aid/CPR certification, ATV and snowmobile safety courses, computer training courses, and other professional courses. Telephone and internet connections have increased with the new staff addition. Office supplies include postage, photocopies, cost-shared a/v equipment,

and miscellaneous office supplies such as envelopes, pens, etc. Computer supplies include floppy disks, zip disks, software. Rent includes office space and utilities. This has increased due to the additional staff. Computer services include one computer lease and a printer. The computer will be an upgrade. Equipment lease (copier) is unchanged from 1999.

PIT Tags
The work plan for this project calls for 25,000 PIT tags, which includes hatchery & natural chinook salmon and hatchery & natural coho salmon tagged groups. Tagging groups will be composed of hatchery releases, summer parr, fall pre-smolts and smolts. This tag number was selected to have sufficient detections at the lower Snake River Dams and McNary Dam to produce reliable survival estimates.

Travel
Travel costs include eight trips for administrative staff (4) and regular staff (4). This includes coordination meetings, professional meetings, project reviews, and symposia, etc. The majority of the travel costs are field per diem and GSA vehicle leases for the crews tending weirs and screw traps.

Indirect
The indirect rate is unchanged from 1999 to 2000.

Subcontractor
An estimated 24 hours of helicopter flight time is needed for redd counts and transporting crews into remote study areas. This has remained the same from 1999. Fish health monitoring will be subcontracted with the USFWS, Dworshak Fish Health Center, Ashaka, ID. for an estimated amount of $36,000.00 Genetic work will be subcontracted with Madison Powell at the University of Idaho for $32,600. Statistical and study design consultation will also accrue on a yearly basis, $10,000.

Other

A Coded Wire Tag detector is needed at each of our weir sites, currently we have two detectors and three weir sites. A new screw trap is needed to replace our Meadow Creek trap, after seven years it has worn out. A new weir that will accommodate both upstream and downstream movement, with angled approach paths is needed. The $79,900 for CWT materials and tagging costs have not increased from 1999.

Section 9. Key personnel

Sherman C. Sprague, Project Leader (1 FTE)
Nez Perce Tribe Department Fisheries Resource Management

EDUCATION
B.S. in Wildlife Resources with Biology Minor, University of Idaho, 1992

PUBLICATIONS
Results of Meadow Creek Fish Trapping, 1994.
Results of Meadow Creek Fish Trapping For the 1995 Migratory Year.
Preliminary Monitoring and Evaluation Results for Coho Salmon Outplanted in the Clearwater River Subbasin, Idaho 1995.

TECHNICAL EXPERIENCE
Project Leader, Nez Perce Tribe, Orofino, ID, Aug. 1997 - Present
Project: Nez Perce Tribal Hatchery, Monitoring and Evaluation Project.

Associate M & E Biologist, Nez Perce Tribe, Orofino, ID, April 1994 - Aug. 1997.
Project: Nez Perce Tribal Hatchery, Monitoring and Evaluation Project.

Wildlife Technician, University of Idaho, Moscow, ID, Feb. 1994 - April 1994.
Project: Mountain Quail Study

Fisheries Technician, Idaho Dept. of Fish and Game, Eagle/Salmon, ID, March 1993 - Feb. 1994
Project: Idaho Supplementation Studies

Fisheries Technician, Idaho Dept. of Fish and Game, Eagle, ID, Summer 1992
Project: Parr-Density Monitoring and Evaluation Project

Biological Aide, Idaho Dept. of Fish and Game, Eagle, ID, Summer 1991 and 1990
Project: Parr-Density Monitoring and Evaluation Project

Duties: project implementation, management and coordination, budget preparation and management, contract and subcontract preparation and management, report writing, personnel supervision, tribal representation in meetings with IDFG, NMFS, BPA, NPPC, CBFWA, and private consultants, data analysis, computer modeling, public speaking and presentations, and proposal development.

Skills:, field data collection and database analysis of anadromous fishes, fish handling and identification, screw trapping, adult weirs and traps, electofishing, seining, hook and line, transect stream survey methodology, snorkel, redd surveys, life history research, diet analysis, GPS, boat operation and maintenance, fish marking (PIT tagging, CWT, fin clips), radio telemetry, spawning adult salmonids, fish culture activities, outplanting salmonids (eyed eggs, parr, smolts, adults)

Assistant Project Leader – New 1999 position to be hired after January 1st,1999.
Qualifications: M.S. degree in biology or fisheries related field or B.S. degree in fisheries or related field with 3 years experience in fisheries research. Must have demonstrated supervisory skills. Expertise in salmonid aquaculture (adult trapping, spawning, and rearing). Understanding of salmonid and resident fish biology, habitat/fish production relationships, and fish ecology. Personal computer literate with IBM

compatible personal computer literate in word processing (Wp 6.1+), spreadsheets, (Lotus 5), data bases (dBASE for Windows, Ptagis). Must be highly motivated with the ability to work independently and have excellent organizational skills to provide support to project leader. Must be able to effectively communicate with others both orally and in writing. Must be mechanically inclined, with ability to construct and repair juvenile and adult escapement monitoring traps.

Biologist - Currently being staffed to fill open from resignation.
Qualifications:

Paul Kucera is the program leader for the Nez Perce Tribal Hatchery Monitoring and Evaluation portion of this project. Mr. Kucera has 23 years professional experience as a Fisheries Biologist in research, management and administration and is a Certified Fisheries Scientist through AFS. He has authored or co-authored seven peer-reviewed fisheries journal publications and over 40 project reports. Responsible for technical program direction and administration of the Fisheries Research Division. This position fills 0.1 FTE.

Education:	Bachelor of Science, 1975	Utah State University
	Major: Fisheries Management	
	Completed MS studies, 1984-1987	University of Idaho
	Major: Fisheries Management	

Jay Hesse is the Research Coordinator for Nez Perce Tribal Hatchery Monitoring and Evaluation portion of this project. Mr. Hesse has five years professional experience as a Fisheries Research Biologist and as the Research Coordinator. He is responsible for the technical direction and supervision of fisheries research division projects, research coordination, and research representation at state and federal meetings. This position fills 0.05 FTE.

Education:	Bachelor of Science, 1992	Michigan State University
	Major: Fisheries and Wildlife	
	Master of Science, 1994	Michigan State University
	Major: Fisheries	

David B. Johnson is the Production Coordinator (0.0FTE) working on NPTH. Mr. Johnson works closely with the NPTH M&E Project Leader and Research Coordinator linking the NPTH production and M&E aspects of this proposal. He has sixteen years of experience conducting field work, and providing management direction on fisheries and watershed projects. Responsible for providing and coordinating analysis of effects, including hatchery production, on aquatic habitat and biota sufficient to meet NEPA and ESA requirements. Responsible for overseeing development and completion of NPTH

M&E Plan. Eleven years of experience working in the Snake River basin, specifically in the Clearwater Subbasin, on issues related to hatchery and natural production, interagency coordination, ESA, and Nez Perce Tribal fishing rights.

Education: BS in Biology, Northern Arizona University, 1979
MS in Biology, Northern Arizona University, 1982

Section 10. Information/technology transfer

The crucial role of communication and information management is implicit in NPTH and M&E goals and objectives. NPTH M&E personnel have developed information management capabilities and mechanisms that will facilitate capturing, storing, retrieval, and analysis of M&E data. The manipulation of M&E data, and the knowledge that emerges from having ready access to this information, occurs through an information system that also serves to coordinate data collection and facilitate communication between databases. Record keeping and quality assurance monitoring are employed to ensure that program measures are being designed and implemented as intended.

All monitoring efforts and results will be summarized and presented in both oral or written format. Project documentation will include quarterly and annual progress reports. Results of earlier data collection and analysis are being readied for publication in a peer reviewed journal, LSRCP program review workshops, CBFWA Project Review Workshops, Section 10 Permit Reports, and Biological Assessments. Results of M&E activities in FY2000 will also be compiled with an eye toward formal publication.

Congratulations!